

FEBRUARY 1961 — 5
VOLUME 87

NO. SM1
PART 2

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**NEWS
OF THE
SOIL
MECHANICS
AND
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DIVISION
OF
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**JOURNAL OF THE SOIL MECHANICS AND FOUNDATIONS DIVISION
PROCEEDINGS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS**

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Proceedings of the American Society of Civil Engineers

NEWS

February, 1961

NEWS FROM EUROPE

The following note was received from Professor A. W. Skempton, D.Sc. (Eng.), M.I.C.E., Imperial College of Science and Technology, University of London:

"Mr. James Sherard visited Imperial College, London, England on November 8th and 9th, 1960. He gave two lectures; the first dealing with stability analysis, and the second with foundation problems arising in earth dam construction. These were very well attended, not only by graduate students of the college, but also by a number of practicing engineers who found what Mr. Sherard had to say very stimulating and useful. Mr. Sherard also took part in quite lengthy discussions with various members of the staff. This group was very pleased to have had this opportunity of meeting and talking with an American Engineer."

CINCINNATI, OHIO

SOIL MECHANICS SYMPOSIUM ON FOUNDATION DESIGN

Cincinnati, Ohio: The Soil Mechanics and Foundations Division of the Cincinnati Section and the Civil Engineering Department of the University of Cincinnati sponsored a Soil Mechanics Symposium on Foundation Design. It was held the evenings of November 29 and December 1, 2, 1960. The Symposium was conducted by selecting and defining a given foundation soil condition and then evaluating the proper type of foundation structure for a heavy rigid framed office building and a relatively light steel framed manufacturing building. Three types of foundation structures, spread footings, piles and raft were discussed for the defined foundation soils, and the proper types selected on the basis of technical and economic considerations. Attendance for the three nights of the Symposium varied from 140 to 170 registrants. Answers to questionnaires distributed indicated that those attending considered the Symposium to be valuable. It also indicated that another Symposium on Slope Stability would be well received.

Note.—No. 1961-5 is Part 2 of the copyrighted Journal of the Soil Mechanics and Foundations Division, Proceedings of the American Society of Civil Engineers, Vol. 87, No. SM 1, February, 1961.

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A.S.T.M. PUBLICATIONS AVAILABLE

At the recent meeting of the Division Executive Committee, it was suggested that members of the Division might be interested in knowing of the recent publication by the American Society for Testing Materials of a single book containing all papers on soils presented at ASTM meetings during 1959.

The ASTM publication is entitled "Papers on Soils, 1959 Meetings," and is designated ASTM Special Technical Publication No. 254. It includes papers presented in symposia on "Time Rates of Loading in Soil Testing," and "Atterberg Limits," as well as a number of papers on general subjects.

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PROCEEDINGS OF THE FIRST PANAMERICAN CONFERENCE ON SOIL MECHANICS AND FOUNDATION ENGINEERING

The Mexican Society of Soil Mechanics has the pleasure to announce the publication of the Proceedings of the First Panamerican Conference on Soil Mechanics and Foundation Engineering, which took place in Mexico City from the 7th to the 12th of September, 1959.

The Proceedings will be composed of three volumes, of approximately 500 pages each, whose contents will be the following:

- Volume I FOUNDATIONS
- Volume II EMBANKMENTS
- Volume III SPECIAL LECTURES-TRANSLATIONS INTO ENGLISH OF
LATIN-AMERICAN PAPERS-GENERAL REPORT OF
SESSIONS.

The three volumes contain sixty-six papers, totaling 1407 pages, by men from seven countries.

Funds obtained through the sale of these Proceedings, will be devoted to the establishment of a permanent fellowship for graduate students who may wish to take special courses on Soil Mechanics at the School of Engineering of the National University of Mexico.

Panamerican graduates in Civil Engineering may be candidates for this fellowship.

The Mexican Society of Soil Mechanics and the Organizing Committee of the First Panamerican Conference on Soil Mechanics and Foundation Engineering, are glad to make this announcement to all patrons of these Proceedings.

Price \$ 375.00 Mex. Cy.

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FOURTEENTH CANADIAN SOIL MECHANICS CONFERENCE

Field consolidation studies of marine sediments beneath earth embankments, river bank stability in glacial lacustrine deposits and geotechnical properties of tills were among the topics discussed at the two-day Soil Mechanics Conference held at Niagara Falls, Ontario, on October 13 and 14, 1960. This was the fourteenth in the series of Soil Mechanics Conferences sponsored by the Associate Committee on Soil and Snow Mechanics of the National Research Council.

Welcoming the guests were Mr. V. Milligan, Chairman of the Toronto Soil Mechanics Group, Professor D. L. Townsend, Chairman of the Soil Mechanics Subcommittee, and Mr. R. F. Legget, Chairman of the Associate Committee on Soil and Snow Mechanics. Speaking briefly on the growing interest and development of the annual conferences, Mr. Legget outlined the recent formation of the Geotechnical Engineering Division of the Engineering Institute of Canada. Three papers were presented by geologists and seven by soil

engineers before an attendance of over 150. In addition, over 30 formal discussions by invitation were presented as well as informal discussions from the floor.

The technical sessions were arranged with the cooperation of Mr. D. J. Bazett, Chairman of a special local Program Committee of the Toronto Soil Mechanics Group, the hosts of this year's Conference. A number of field trips were available on the second afternoon. These included a field study of the Niagara Gorge geology, a visit to the H. G. Acres Laboratory, and the Reservoir Pumping Station of the Hydro-Electric Power Commission of Ontario. The only social event of the Conference was a dinner sponsored jointly by the Niagara Group of the Professional Engineers of Ontario and the Niagara Peninsula Branch of the EIC. This was followed by a delightful talk by Dr. H. Q. Golder on "Casting For Pearls".

The success of the Conference was attributed in large measure to the growing inter-disciplinary exchange of information between Pleistocene geologists and soil engineers from universities, government institutions, and private engineering firms from all parts of Canada.

The technical deliberations were divided between three half-day sessions dealing respectively with till, glacial lacustrine sediments and marine sediments. A paper on the geology of the deposits preceded the soil engineering papers at each session.

Professor J. A. Elson of McGill University reviewed the processes of forming till and presented a novel idea on the formation of a compact till. Apparently, it has been shown that the energy involved in producing a compact till by crushing and grinding rock beneath the glacier produces just sufficient heat to melt enough ice to provide an optimum soil moisture content for development of till.

Shear strength and other mechanical test results on typical till deposits from widely separated areas in Ontario - Otter Rapids and Cornwall - were presented by J. I. Adams of the Hydro-Electric Power Commission of Ontario. Both locations have upper and lower tills of different glacial times separated by soft lacustrine sediments in some areas representing an interstadial period. An unusual feature of the lower till at Cornwall is its extremely high in-place density (nearly 150 lb/ft³) and the low saturated moisture content of 5 to 8%.

The origin and mode of deposition of some soils in the peninsular counties of Southwestern Ontario is still a controversial issue. From the results of soil engineering studies, Messrs. L. G. Soderman and A. K. Loh of the Department of Highways of Ontario and T. C. Kenney of H. G. Acres, concluded that two types of soils exist in the region, although, outwardly they appeared very similar. Instead of classifying both as tills, one appeared to be a normally consolidated lacustrine clay and the other a till with varying degrees of overconsolidation. Such information will be welcomed by the geologist when attempting to unravel the glacial geology of that area.

Canadian Pleistocene marine clays are largely confined to three regions, according to Dr. P. F. Karrow of the Ontario Department of Mines. The areas are Arctic Canada and the Hudson Bay Lowlands, the Pacific Coast area and the St. Lawrence Lowlands. The marine deposits present unique engineering problems because of the large change in strength between the undisturbed and remoulded state. Such soils frequently have natural moisture contents well in excess of the liquid limit. At present, pore water salt concentrations 1 to 3 gr/litre are frequently encountered in the Ottawa area with

some occasional extremes up to 16 gr./litre based on the work of the Division of Building Research of the National Research Council.

Mr. W. J. Eden of the Division of Building Research described field studies on the consolidation properties of Leda clay under two large fills. Although it was still too early to present definite conclusions, the amount of settlement predicted at both sites from laboratory tests appeared to be much greater than the field settlement measured. The instrumentation, which includes remote reading, electrical settlement gauges at the Green's Creek location, designed by his colleague K. N. Burn, were described. The marine deposit beneath the Kars bridge fill was much more extensively instrumented, including piezometers, a lateral movement gauge, as well as settlement gauges.

The presence of extensive marine sediments along the steep shores of Vancouver island and the B. C. mainland has not been widely known. The site of investigation for a Trans-Canada Highway bridge at Port Mann uncovered some 70 ft. of marine deposits at about 100 ft. from the present ground surface. In a paper describing this work, R. A. Spence of Vancouver gave detailed site investigation and soil test results. This represents one of the first published engineering papers on the marine sediments of the West Coast area of Canada. Sensitivity values ranged between 8 to 100, natural moisture contents from 30 to 80%, and unconfined compression tests gave shear strength values of 1000 lb/ft².

Mr. K. Peaker of the Department of Highways of Ontario outlined construction problems on marine sediments and indicated that many miles of highway and numerous structures had been built successfully on such sediments with overpass structures where approach fills of around 30 ft. were necessary. One such fill, described in detail, was successfully completed in June 1960 by using counterbalancing berms.

In describing the geology of lacustrine clays, Professor R. E. Deane of the University of Toronto stated that the manner in which material brought into a glacial lake is deposited is still hypothetical. He described recent observations on glacial lakes at Fabbin and Ellesmere Islands as to water temperature, the effect of low water density, pH, stream load and areas of deposition, but pointed out that applicability of these observations to Pleistocene times with regard to the formation of varves was not known.

The most unstable portions of river banks in the metropolitan Winnipeg area are those on the concave side of a river curve. These areas have either been affected by an old slide in the past, are presently sliding, or have required stabilization, according to Professor A. Baracos of the University of Manitoba. The most serious slides were shown to involve movement along an approximately circular sliding arc. In many cases, development of river bank property has been precluded because of the sliding hazards. Rip rap and piling protection at the toe of the bank have been employed to retain the factor of safety by preventing further erosion. Using field determined values for shear strength, it has been shown that stability analyses can be made in terms of total stress. Analyses in terms of effective stresses are now being made in an attempt to provide a more rational explanation of failure in these soils.

The last paper at the Conference was based on a study of the geotechnical properties of varved clays as reported in Canadian engineering case records. Dr. J. B. Metcalf, a post-doctorate fellow of the National Research Council studying at Queen's University, and Professor Townsend of Queen's

University, the joint authors of the paper, made some suggestions for the improvement of routine commercial testing techniques which included recording the individual layers in the undisturbed state and after consolidation tests. Atterberg limits should be done on the actual samples used for strength and consolidation tests and, if possible, should also be done on the individual layers of the varves.

The proceedings of the annual Soil Mechanics Conferences are published in the series of Technical Memoranda of the Associate Committee on Soil and Snow mechanics. Copies of the Fourteenth Conference will be available in about six months and may be obtained by writing to the Secretary, Associate Committee on Soil and Snow Mechanics, c/o Division of Building Research, National Research Council, Ottawa.

ASCE SYMPOSIUM ON ROCKFILL DAMS

At the meeting of the ASCE Board of Direction, in Reno in June 1960, it was arranged that the complete Symposium on Rockfill Dams of some seven hundred pages be published in one bound volume as ASCE TRANSACTIONS, 1960, Volume 125, Part II.

The volume will include all ASCE literature on the subject of rockfill dams from October 1954 to October 1960. It will comprise 24 papers and 75 discussions; the discussions following each paper. This special volume of 1960 ASCE TRANSACTIONS will provide a comprehensive, up-to-date and convenient reference volume on rockfill dams.

ASCE TRANSACTIONS, 1960, Volume 125, Part II will be available in March 1961 and will be priced at \$12, making it available to ASCE members at \$6 with the usual 50% discount.

The Symposium has been planned to assemble design, construction and performance data on most of the world's higher rockfill dams. The presentation of settlement data has been emphasized and detailed data on many high dams has been made available for the first time in the papers and discussions.

For purposes of the Symposium, a rockfill dam was defined to be one that relies on rock, either dumped or compacted in layers, as a major structural element. Included are rockfill dams of the types with (1) impervious face membranes, (2) sloping earth cores, (3) thin central cores, and (4) thick central cores. Some of the notable dams covered in the Symposium and listed by the above types are: (1) Dix River, Salt Springs, Montgomery, Cogswell, San Gabriel, Lower Bear River, Paradela, Wishon, Courtright, Pinzanes, Nozori, and Ishibuchi; (2) Nantahala, Kenney, Brownlee, Bersimis, Dalles Closure, Translet, Miboro, Hirfanli, Queens Creek, Cedar Cliss, Bear Creek and Furnas; (3) Makio, Derbendi Khan, Kajakai, Mud Mountain, Goschener, Messaure and Cougar; and (4) Nottely, Watauga, South Holston and Cherry.

Rockfill dams are being increasingly adopted throughout the world and are being constructed to ever-increasing heights. This Symposium will certainly contribute toward improved, more economic and higher rockfill dams of all types.

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Executive Secretary
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Please send me copy(s) of ASCE TRANSACTIONS, 1960, Volume 125,
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